

Features

Unregulated Converters

- UL/CSA and EN-60950-1 Safety certified
- EN-60601 for Medical Applications
- 6kVDC Isolation
- Optional Continuous Short Circuit Protection
- Efficiency up to 80%
- Space Saving „Skinny DIP“ Package
- Very Low Isolation Capacitance

Selection Guide

| Part Number SIP 7 | Input Voltage (VDC) | Output Voltage (VDC) | Output Current (mA) | Efficiency Std (%) | Max Capacitive Load ⁽¹⁾ |
|----------------------|------------------------|-------------------------|------------------------|--------------------------|---------------------------------------|
| RV-xx3.3S | 3.3, 5, 12, 15, 24 | 3.3 | 600 | 70 | 3300µF |
| RV-xx05S | 3.3, 5, 12, 15, 24 | 5 | 400 | 70-75 | 1200µF |
| RV-xx09S | 3.3, 5, 12, 15, 24 | 9 | 222 | 70-75 | 1200µF |
| RV-xx12S | 3.3, 5, 12, 15, 24 | 12 | 167 | 70-75 | 680µF |
| RV-xx15S | 3.3, 5, 12, 15, 24 | 15 | 132 | 75-80 | 680µF |
| RV-xx24S | 3.3, 5, 12, 15, 24 | 24 | 83 | 75-80 | 470µF |
| RV-xx3.3D | 3.3, 5, 12, 15, 24 | ±3.3 | ±300 | 70 | ±1500µF |
| RV-xx05D | 3.3, 5, 12, 15, 24 | ±5 | ±200 | 70-75 | ±470µF |
| RV-xx09D | 3.3, 5, 12, 15, 24 | ±9 | ±111 | 70-75 | ±470µF |
| RV-xx12D | 3.3, 5, 12, 15, 24 | ±12 | ±85 | 70-75 | ±220µF |
| RV-xx15D | 3.3, 5, 12, 15, 24 | ±15 | ±66 | 75-80 | ±220µF |
| RV-xx24D | 3.3, 5, 12, 15, 24 | ±24 | ±42 | 75-80 | ±100µF |

xx = Input Voltage. Other input and output voltage combinations available on request.

No suffix is 6kVDC functional isolation

* add Suffix "P" for Continuous Short Circuit Protection, e.g. RV-0505S/P, RV-0505D/P

Specifications (measured at $T_A = 25^\circ\text{C}$, nominal input voltage, full load and after warm-up)

| | | |
|--|---|--------------------------------------|
| Input Voltage Range | | ±10% |
| Output Voltage Accuracy | | ±5% |
| Line Voltage Regulation | | 1.2%/1% of V_{in} typ. |
| Load Voltage Regulation (10% to 100% full load) | 3.3V output types 5V output type 9V, 12V, 15V, 24V output types | 20% max. 15% max. 10% max. |
| Output Ripple and Noise (20MHz limited) | | 200mVp-p max. |
| Operating Frequency | | 20kHz min. / 50kHz typ. / 85kHz max. |
| Efficiency at Full Load | | 70% min. / 75% typ. |
| Minimum Load = 0% | Specifications valid for 10% minimum load only. | |
| Isolation Voltage | (tested for 1 second) (rated for 1 minute) | 6000VDC 3000VAC / 60Hz |
| Isolation Capacitance | | 2pF min. / 12pF max. |
| Isolation Resistance | | 15 GΩ min. |
| Short Circuit Protection P-Suffix | | 1 Second Continuous |
| Operating Temperature Range (free air convection) | | -40°C to +85°C (see Graph) |
| Storage Temperature Range | | -55°C to +125°C |
| Relative Humidity | | 95% RH |
| Package Weight | | 9g |
| Packing Quantity | | 15 pcs per Tube cont. |

ECONOLINE

DC/DC-Converter

with 3 year Warranty

RECOM

2 Watt DIP24 Miniature Single & Dual Output



EN-60950-1 Certified
EN-60601-1 Certified
UL/CSA 60950-1 Certified
IEC 60601-1 CB Report

RV

Description

Very high isolation in a small size are the main features of this miniature DIP24 converter, ideal for highly sophisticated industrial, test and measurement and medical designs where board space is at a premium.

Derating-Graph (Ambient Temperature)



Refer to Application Notes

Tolerance Envelope



Specifications (continued)

| | | | |
|----------------|---|---|---|
| MTBF (+25°C) | Detailed Information see Application Notes chapter "MTBF" | using MIL-HDBK 217F | 1154 x 10 ³ hours |
| (+85°C) | | using MIL-HDBK 217F | 168 x 10 ³ hours |
| Certifications | UL/cUL General Safety | Report: E248550 | UL 60950-1 1st Ed. |
| | EN General Safety | Report: PS-R7219C1 | EN60950-1:2001 + A11: 2004 |
| | CB/EN Medical Safety | Report: MDD1205098-4 + RM1205098-4 IEC/EN 60601-1 3rd Edition | Medical Report + ISO14971 Risk Assessment |

Notes

Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

Typical Characteristics

RV-xx05S



RV-xx12S



RV-xx05D



RV-xx12D



Package Style and Pinning (mm)



24 PIN DIP Miniature Package Style



Recommended Footprint Details



Pin Connections

| Pin # | Single |
|----------------|--------|
| 1 | +Vin |
| 2 | -Vin |
| 8, 9, 11, 14 | NC |
| 10, 15 | -Vout |
| 12 & 13 | +Vout |
| 16, 17, 23, 24 | NC |

Pin Connections

| Pin # | Dual |
|-----------------------|-------|
| 1 | +Vin |
| 2 | -Vin |
| 8, 17 | -Vout |
| 9, 11, 14, 16, 23, 24 | NC |
| 10 & 15 | Com |
| 12, 13 | +Vout |

XX.X ± 0.5 mm
XX.XX ± 0.25 mm

Features

Unregulated Converters

- UL/CSA and EN-60950-1 Safety certified
- EN-61010 for Test, Measurement and Lab Use
- UL/CSA and EN-60601 for Medical Applications
- 6.4kVDC or 8kV Reinforced Isolation
- Optional Continuous Short Circuit Protection
- Efficiency to 88%
- Space Saving „Skinny DIP“ Package
- Very Low Isolation Capacitance

Selection Guide

| Part Number SIP 7 | Reinforced Isolation (kVDC) | Input Voltage (VDC) | Output Voltage (VDC) | Output Current (mA) | Efficiency Std (%) | Max Capacitive Load ⁽¹⁾ |
|----------------------|-----------------------------|---------------------|----------------------|---------------------|--------------------|------------------------------------|
| RV-xx3.3S | /R6.4 & /R8 | 3.3, 5, 12, 15, 24 | 3.3 | 600 | 70-78 | 3300µF |
| RV-xx05S | /R6.4 & /R8 | 3.3, 5, 12, 15, 24 | 5 | 400 | 76-80 | 1200µF |
| RV-xx09S | /R6.4 & /R8 | 3.3, 5, 12, 15, 24 | 9 | 222 | 78-85 | 1200µF |
| RV-xx12S | /R6.4 & /R8 | 3.3, 5, 12, 15, 24 | 12 | 167 | 78-85 | 680µF |
| RV-xx15S | /R6.4 & /R8 | 3.3, 5, 12, 15, 24 | 15 | 132 | 78-88 | 680µF |
| RV-xx3.3D | /R6.4 & /R8 | 3.3, 5, 12, 15, 24 | ±3.3 | ±300 | 70-78 | ±1500µF |
| RV-xx05D | /R6.4 & /R8 | 3.3, 5, 12, 15, 24 | ±5 | ±200 | 75-82 | ±470µF |
| RV-xx09D | /R6.4 & /R8 | 3.3, 5, 12, 15, 24 | ±9 | ±111 | 76-84 | ±470µF |
| RV-xx12D | /R6.4 & /R8 | 3.3, 5, 12, 15, 24 | ±12 | ±85 | 78-86 | ±220µF |
| RV-xx15D | /R6.4 & /R8 | 3.3, 5, 12, 15, 24 | ±15 | ±66 | 78-86 | ±220µF |

xx = Input Voltage. Other input and output voltage combinations available on request.

No suffix is 6kVDC functional isolation

* add Suffix "P" for Continuous Short Circuit Protection, e.g. RV-0505S/P, RV-0505D/P

* add Suffix "/R6.4" or "/R8" for Reinforced Isolation, e.g. RV-0505S/R6.4, RV-0505D/P/R8

Specifications (measured at T_A = 25°C, nominal input voltage, full load and after warm-up)

| | | |
|---|---|----------------|
| Input Voltage Range | ±10% | |
| Output Voltage Accuracy | ±5% | |
| Line Voltage Regulation | 1.2%/1% of Vin typ. | |
| Load Voltage Regulation (10% to 100% full load) | 3.3V output types | 20% max. |
| | 5V output type | 15% max. |
| | 9V, 12V, 15V, 24V output types | 10% max. |
| Output Ripple and Noise (20MHz limited) | 200mVp-p max. | |
| Operating Frequency | 20kHz min. / 50kHz typ. / 85kHz max. | |
| Efficiency at Full Load | 70% min. / 75% typ. | |
| Minimum Load = 0% | Specifications valid for 10% minimum load only. | |
| /R6.4 | (tested for 1 second) | 6400VDC |
| | (rated for 1 minute) | 3200VAC / 60Hz |
| /R8 | (tested for 1 second) | 8000VDC |
| | (rated for 1 minute) | 4000VAC / 60Hz |
| Isolation Capacitance | 2pF min. / 12pF max. | |
| Isolation Resistance | 15 GΩ min. | |
| Short Circuit Protection | 1 Second | |
| P-Suffix | Continuous | |
| Operating Temperature Range (free air convection) | -40°C to +85°C (see Graph) | |
| Storage Temperature Range | -55°C to +125°C | |
| Relative Humidity | 95% RH | |
| Package Weight | 9g | |
| Packing Quantity | 15 pcs per Tube | |

cont.

ECONOLINE

DC/DC-Converter

with 3 year Warranty

RECOM

2 Watt DIP24

Miniature Single & Dual Output



RECOM
E-224736



- EN-60950-1 Certified**
- EN-60601-1 Certified**
- UL/CSA 60950-1 Certified**
- UL-60601-1 Certified**
- EN-61010-1 Certified**
- IEC-60601-1 CB Report**

RV/R

Description

Very high isolation in a small size are the main features of this miniature DIP24 converter, ideal for highly sophisticated industrial, test and measurement and medical designs where board space is at a premium.

Derating-Graph (Ambient Temperature)



Refer to Application Notes

Tolerance Envelope



Specifications (continued)

| | | | |
|--|---|---------------------|---|
| MTBF (+25°C) | Detailed Information see Application Notes chapter "MTBF" | using MIL-HDBK 217F | 1154 x 10 ³ hours |
| (+85°C) | | using MIL-HDBK 217F | 168 x 10 ³ hours |
| Reinforced Isolation | Transformer Creepage | /R6.4 Types | 5.5 mm min. |
| | Transformer Clearance | /R6.4 Types | 5.5 mm min. |
| | PCB Creepage & Clearance | /R6.4 Types | 4.8 mm min. |
| Certifications | | | |
| Measurement, Control and Laboratory Use Safety | Report: IL091212010M1 | | EN 61010-1 : 2001 |
| CSA General Safety | | | UL 60950-1 1st Ed. |
| | | | C22.2 No. 60950-1-03 |
| | | | UL60601-1 1st Edition |
| UL/cUL Medical Safety | Report: E314885-A2-UL | | UL60601-1 1st Edition |
| CSA Medical Safety | Report: 2207629 | | CAN/CSA-22.2 No 601.1-M90 |
| EN General Safety | Report: PS-R7219C1 | | EN60950-1:2001 + A11: 2004 |
| EN Medical Safety | Report: MDD1205098-1 + RM1205098-1 | | IEC/EN 60601-1 3rd Edition |
| | | | Medical Report + ISO14971 Risk Assessment |

Notes

Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

Typical Characteristics

RV-xx05S/R6.4

RV-xx05S/R8



RV-xx05D/R6.4 RV-xx05D/R8



Package Style and Pinning (mm)



24 PIN DIP Miniature Package Style



Recommended Footprint Details



Pin Connections

| Pin # | Single |
|----------------|--------|
| 1 | +Vin |
| 2 | -Vin |
| 8, 9, 11, 14 | NC |
| 10, 15 | -Vout |
| 12 & 13 | +Vout |
| 16, 17, 23, 24 | NC |

Pin Connections

| Pin # | Dual |
|-----------------------|-------|
| 1 | +Vin |
| 2 | -Vin |
| 8, 17 | -Vout |
| 9, 11, 14, 16, 23, 24 | NC |
| 10 & 15 | Com |
| 12, 13 | +Vout |

XX.X ± 0.5 mm
XX.XX ± 0.25 mm

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- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
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- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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JONHON

«JONHON» (основан в 1970 г.)

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(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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